Agilent E6474A

Mobile Voice MOS Test (VMT) Application

Getting Started Guide

Agilent Technologies

Notices

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A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Introduction

The Agilent Drive-Test solution is designed to allow benchmarking and qualification of voice quality over a cellular network. The measurement system consists of one set of equipment in the central office (CO) to process data for uplink measurement, and a second set of equipment in a mobile unit for processing downlink measurement. The information in this guide contains important information about setting up the system to run measurements.

Features

The Agilent Drive-Test solution has the following features:

- Scalable system capable of measuring up to four channels
- Calls initiated and ended by independent channels
- Measurement of downlink and uplink MOS (Mean Opinion Score)
- Mobile-originated calls (MOC)
- Mobile terminated calls (MTC)
- Mobile-to-Mobile voice quality testing (M2M)
- Mobile-to-PSTN voice quality testing
- Easily configured call duration
- Supports ITU-T's P862/P862.1 PESQ/LQO algorithm for voice quality measurement
- Time-stamped MOS results

System Components

The Agilent Mobile VMT Software solution consists of the following system components:

- B9990A-200 Mobile VQT Software, single phone.
- B9990A-300 Mobile VQT Software, multi-phone upgrade.
- B9990A-400 Office Unit Voice MOS Test
- PCs (desktop or notebook) for system control and data mining. One is required in the central office and another in the mobile van.

- Phone specific cables.
  - E6473B- 882 - Nokia POP port to sound module cable.
  - E6473B- 883 - 2.5mm jack-plug to sound module cable.

NOTE: PCs are supplied for the client-side of the system

Minimum PC Specifications

Refer to the Agilent E6474A User's Guide (E6474-90090) for details on the minimum and recommended PC specifications.

Setup and Operation Overview

The setup and operation of the measurement system may differ slightly for each usage scenario. In general, the setup and operation consist of these stages:

- Hardware connections
- Software installation
- Measurement configurations
- Measurement executions & results viewing

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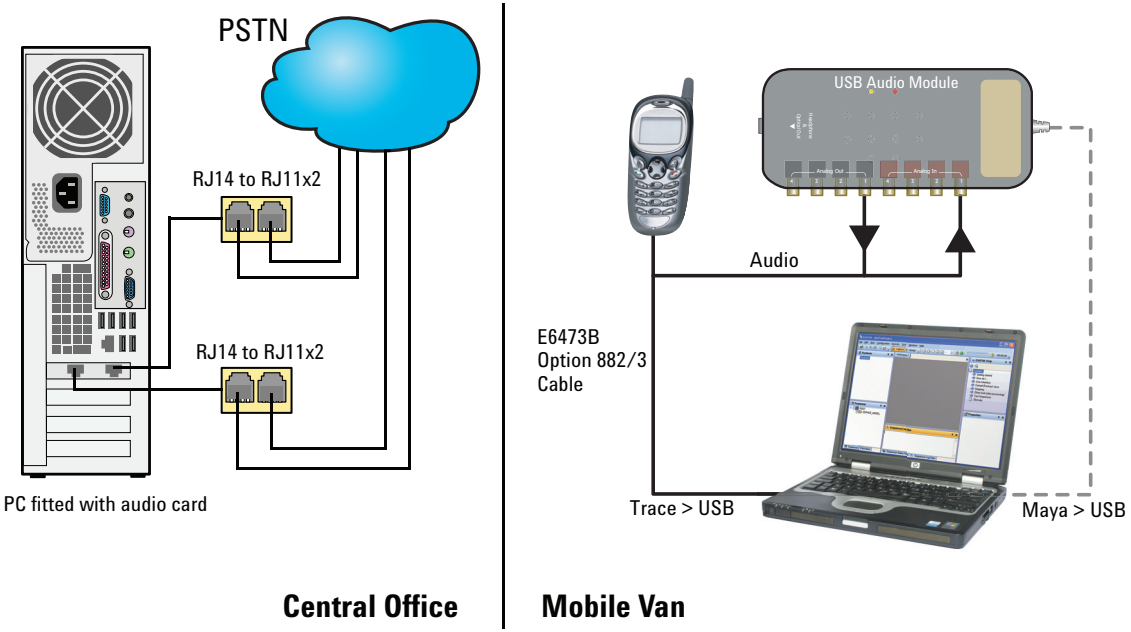
This chapter covers the setup of the hardware and software in the Agilent Mobile Voice MOS Test Software system.

Setting up the hardware

Figure 1 shows an overview of the setup of the hardware for Agilent Mobile Voice MOS Test Software solution. Details of the central office and mobile van configuration are provided in this chapter.

Figure 1 Typical configuration



NOTE Some phones provide ear, microphone and trace information through the same port. Ensure you have the correct interface cable for the audio module and laptop connection.

Setting up the Central Office (CO) equipment

Up to four channels can be linked for each control PC in the central office. To set up the equipment in the central office:

1 Connect CO equipment's analog port to POTs with a RJ-11 cable.

NOTE

Only analog phone line should be used. The equipment does *not* work with digital telephone lines.

Write down the phone number of the each line.

2 Connect an RJ-14 to RJ11 splitter to each of the two ports on the rear of the office equipment. The ports on the equipment correspond to port 1 and 3.

3 Connect the four ports on the RJ-11 splitters to your PSTN phone lines.

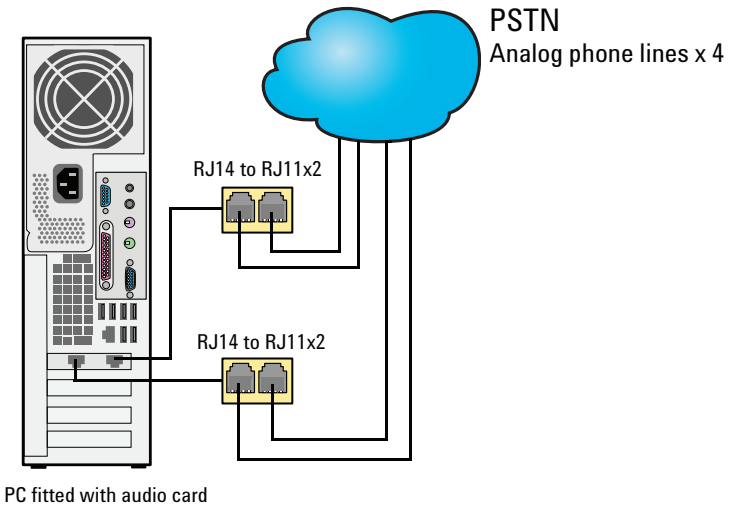


Figure 2 Central Office (CO) configuration

Setting up the Mobile van equipment

To set up the equipment in the mobile van:

1. Install and configure your USB Audio Module. Refer to manufacturers instructions for more information.
2. Connect the phone ear-port to the Analog In, Channel 1 of the USB Audio Module.
3. Connect the phone microphone-port to the Analog Out, Channel 1 of the USB Audio Module.
4. Connect the phone trace-port to your laptop.
5. (optional) Repeat steps 2-4 if you wish to use more than one phone

NOTE You need specific phone connection cables to provide these connections. Refer to the supported phone list provided with the E6474A Wireless Network Measurement Software (Supported phone list can be found in the Library).

Refer to Figure 3 on page 11 for a typical one phone mobile van configuration.

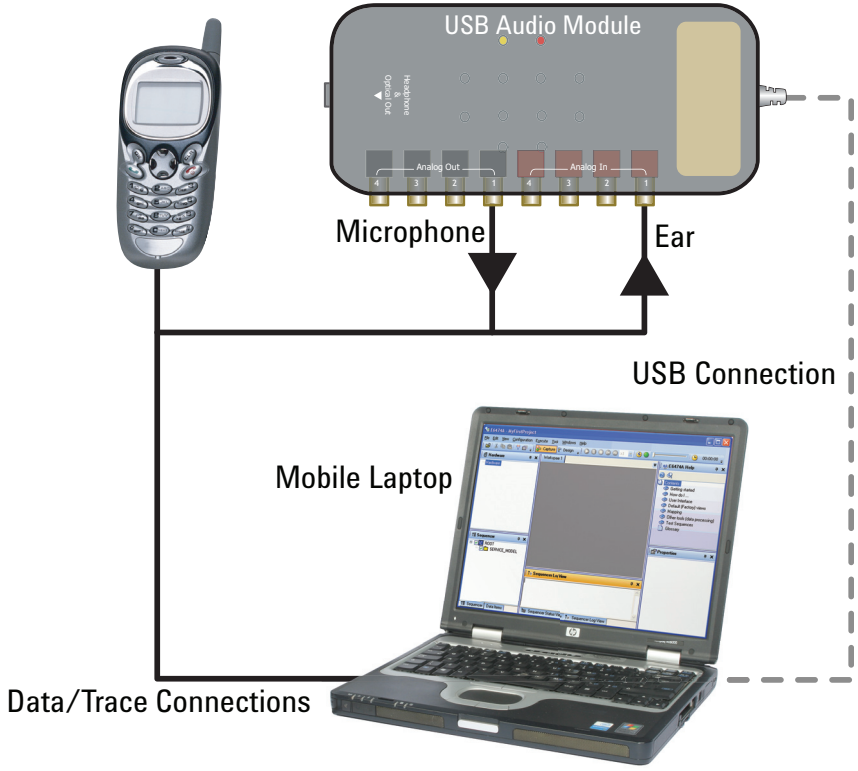


Figure 3 Typical one-phone mobile van configuration

Setting up the software and license key (Central Office)

The central office software has already been installed and pre-configured. By default the system is supplied with the following Windows® login and password:

Login: agilent

Password: agilent

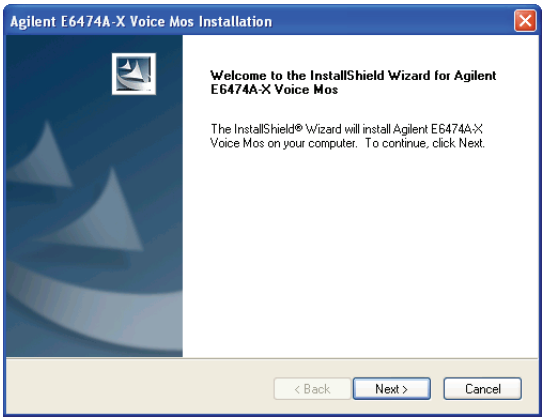
The following procedure may be used if the software has to be re-installed. Contact your local Agilent sales representative if you have any problems with the installation.

Installing the VQT and Office applications at the Central Office

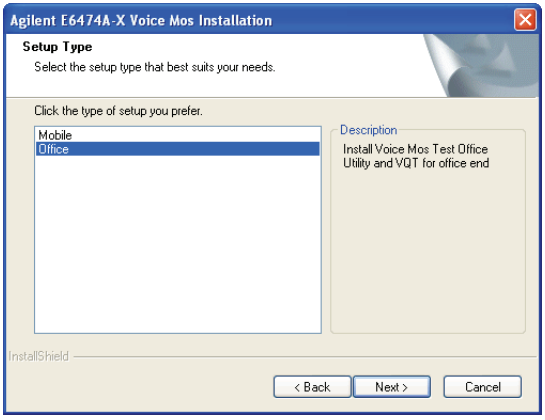
The Agilent Mobile Voice MOS Test Software solution consists of the VQT (including PESQ algorithm) and Voice MOS Test Office Utility applications.

To install:

Do This		Notes
1	**Insert** the CD	This CD contains several applications.
2	Your system may have autostart or go to the **Start** button, click **Run** and type D:\setup (where D is your CD drive).	The following installation dialog appears (see below).


Agilent E6474A-X Voice Mos Installation
Welcome to the InstallShield Wizard for Agilent E6474A-X Voice Mos
The InstallShield® Wizard will install Agilent E6474A-X Voice Mos on your computer. To continue, click Next.
< Back
Next >
Cancel

3	Step through the installation screens until you see the option for Mobile or Office installation	The following installation dialog appears (see below).



4	Select **Office** to Install Voice Quality Test (VQT) software Edition 4.5	Follow the installation instructions. Use the default directories

Setting up the VQT license keys

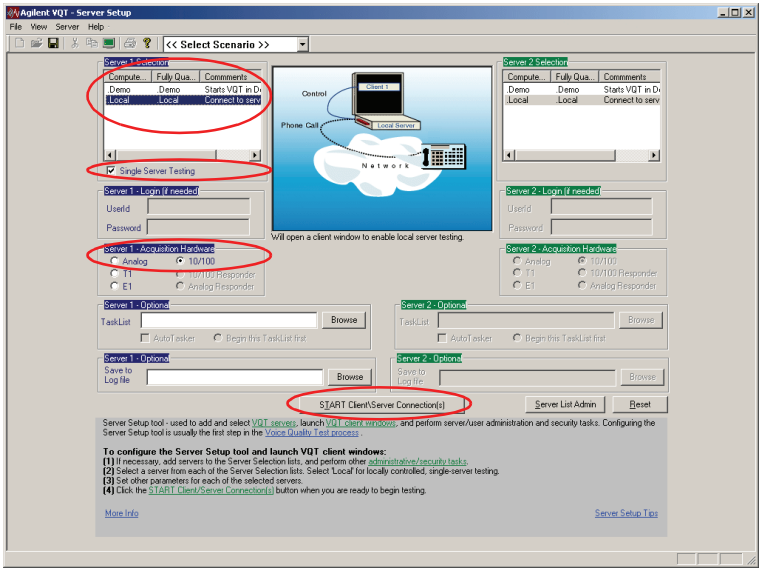
NOTE An Ethernet connection to the equipment is required before you can enter the 10/100 Ethernet license.

Follow these steps:

1 Start the Voice MOS Test application.

The **Server Setup** dialog box appears.

Figure 4 Server Setup dialog box


Agilent VQT - Server Setup
File View Server Help
<< Select Scenario >>
Server 1 Selection
Compute... Fully Qua... Comments
Demo Demo Starts VQT in Dx
Local Local Connect to serv
Single Server Testing
Server 1 - Login (if needed)
UserId
Password
Server 1 - Acquisition Hardware
Analog
10/100
T1
10/100 Responder
E1
Analog Responder
Server 1 - Optional
TaskList
Browse
AutoTasker
Begin this TaskList first
Save to Log file
Control
Client 1
Phone Call
Local Server
Network
Will open a client window to enable local server testing.
Server 2 Selection
Server 2 - Login (if needed)
Server 2 - Acquisition Hardware
Server 2 - Optional
START Client\Server Connection(s)
Server List Admin
Reset
Server Setup tool - used to add and select VQT servers, launch VQT client windows, and perform server/user administration and security tasks. Configuring the Server Setup tool is usually the first step in the Voice Quality Test process.
To configure the Server Setup tool and launch VQT client windows:
(1) If necessary, add servers to the Server Selection lists, and perform other administrative/security tasks.
(2) Select a server from each of the Server Selection lists. Select 'Local' for locally controlled, single-server testing.
(3) Set other parameters for each of the selected servers.
(4) Click the START Client/Server Connection(s) button when you are ready to begin testing.
More Info
Server Setup Tips

2 In the **Server 1 Selection** list, select **Local**.

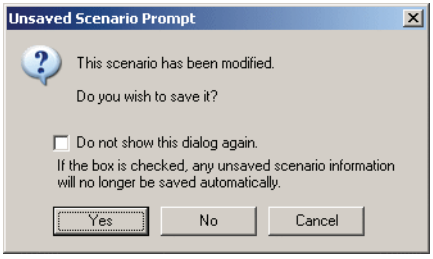
3 Select the **Single Server Testing** check box.

4 Under **Server 1 - Acquisition Hardware**, select **10/100**.

5 Click **START Client/Server Connections**.

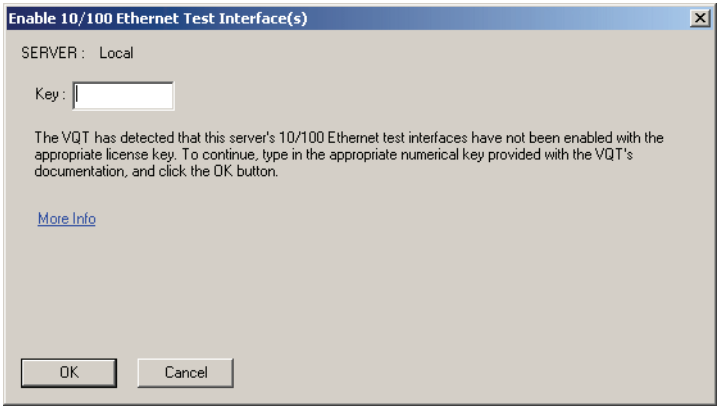
You are prompted to save your configuration. Select **Yes** and enter a configuration name (Figure 5).

Figure 5 Unsaved Scenario Dialog


Unsaved Scenario Prompt
This scenario has been modified.
Do you wish to save it?
Do not show this dialog again.
If the box is checked, any unsaved scenario information will no longer be saved automatically.
Yes
No
Cancel

After you have saved the configuration the **Enable 10/100 Ethernet Test Interface(s)** dialog box appears (Figure 6).

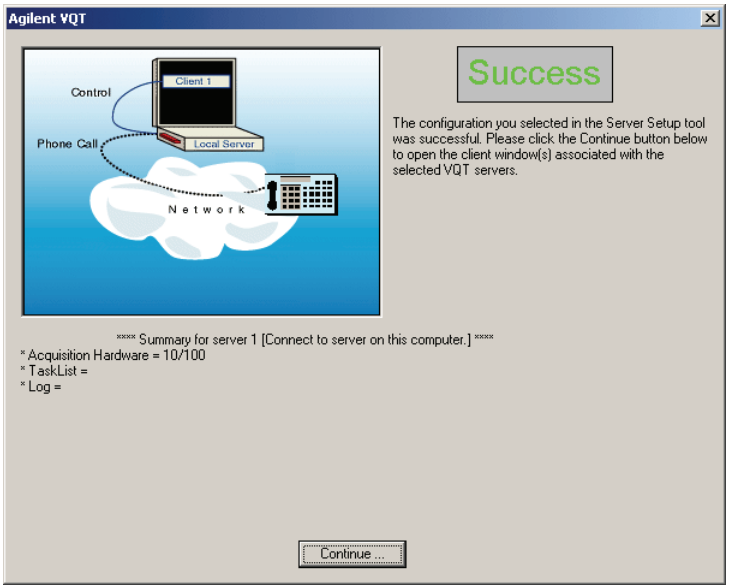
Figure 6 Enable 10/100 Ethernet Test Interface(s) dialog box


Enable 10/100 Ethernet Test Interface(s)
SERVER : Local
Key :
The VQT has detected that this server's 10/100 Ethernet test interfaces have not been enabled with the appropriate license key. To continue, type in the appropriate numerical key provided with the VQT's documentation, and click the OK button.
More Info
OK
Cancel

6 Enter the 10/100 license key and click **OK**.

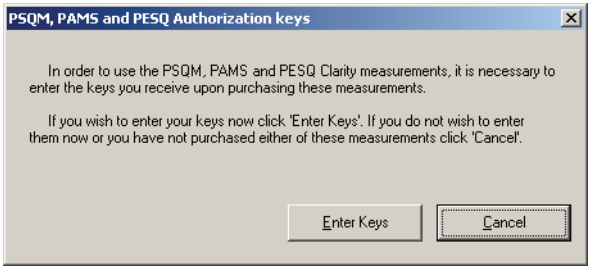
7 When the **Success** dialog appears, select **Continue** (Figure 7).

Figure 7 10/100 License Success Dialog


Agilent VQT
Control
Client 1
Phone Call
Local Server
Network
Success
The configuration you selected in the Server Setup tool was successful. Please click the Continue button below to open the client window(s) associated with the selected VQT servers.
***** Summary for server 1 [Connect to server on this computer.] *****
* Acquisition Hardware = 10/100
* TaskList =
* Log =
Continue ...

8 In the PSQM, PAMS and PESQ Authorization keys dialog, select **Enter Keys** (Figure 8).

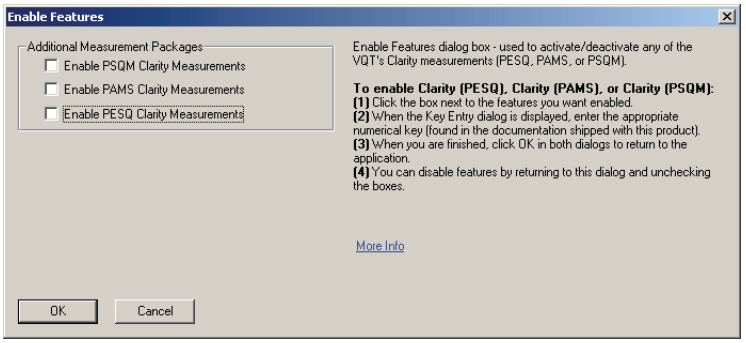
Figure 8 PSQM, PAMS and PESQ Authorization keys dialog


PSQM, PAMS and PESQ Authorization keys
In order to use the PSQM, PAMS and PESQ Clarity measurements, it is necessary to enter the keys you receive upon purchasing these measurements.
If you wish to enter your keys now click 'Enter Keys'. If you do not wish to enter them now or you have not purchased either of these measurements click 'Cancel'.
Enter Keys
Cancel

9 In the Enable Features dialog, select the **Enable PESQ Clarity Measurement** option.

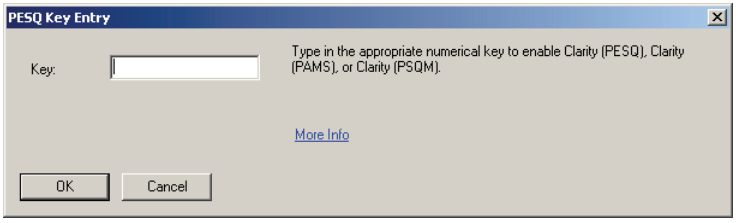
The **PESQ Key Entry** dialog box appears (Figure 9).

Figure 9 Enabling ITU standard PESQ measurement


Enable Features
Additional Measurement Packages
Enable PSQM Clarity Measurements
Enable PAMS Clarity Measurements
Enable PESQ Clarity Measurements
Enable Features dialog box - used to activate/deactivate any of the VQT's Clarity measurements (PESQ, PAMS, or PSQM).
To enable Clarity (PESQ), Clarity (PAMS), or Clarity (PSQM):
(1) Click the box next to the features you want enabled.
(2) When the Key Entry dialog is displayed, enter the appropriate numerical key (found in the documentation shipped with this product).
(3) When you are finished, click OK in both dialogs to return to the application.
(4) You can disable features by returning to this dialog and unchecking the boxes.
More Info
OK
Cancel

10 Enter the PESQ key and then click **OK**.

Figure 10 PESQ Key Entry dialog box



11 Click **OK** to close the **Enable Features** dialog box.

12 Exit the VQT application and proceed to the next stage of the installation.

Re-installing PCI card drivers

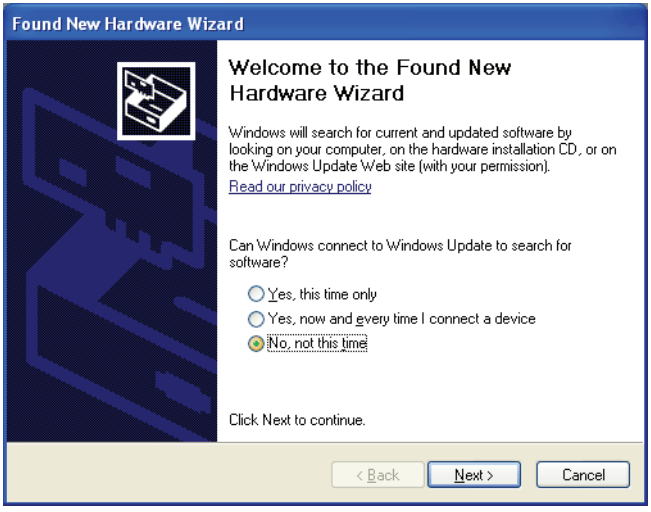
Your office PC is supplied with a fully configured and working PCI audio card. However the card or driver can be damaged while in transit to your location. When your PC starts the operating system checks all the hardware and drivers. If there is an issue, the system will report “new hardware found”. Follow this procedure to re-install the PCI audio card driver.

1 If new hardware is detected, the new hardware wizard starts.

2 Follow the wizard instructions.

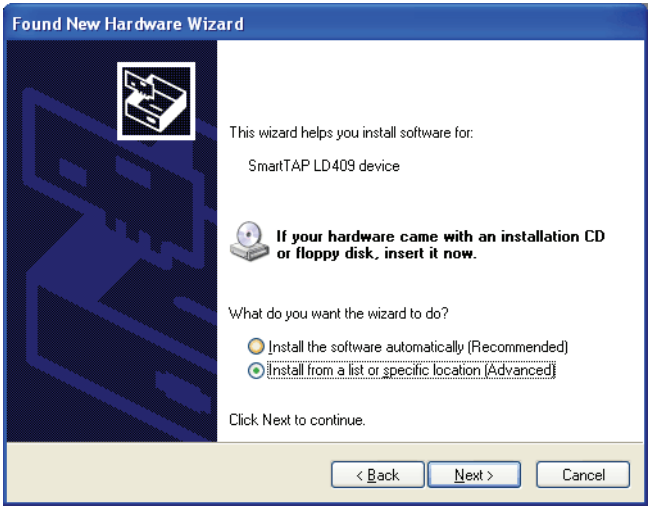
3 When the wizard asks for a driver location for the installation, select “No, not this time”. Refer to Figure 11.

Figure 11 Found new hardware


Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).
Read our privacy policy
Can Windows connect to Windows Update to search for software?
Yes, this time only
Yes, now and every time I connect a device
No, not this time
Click Next to continue.
< Back
Next >
Cancel

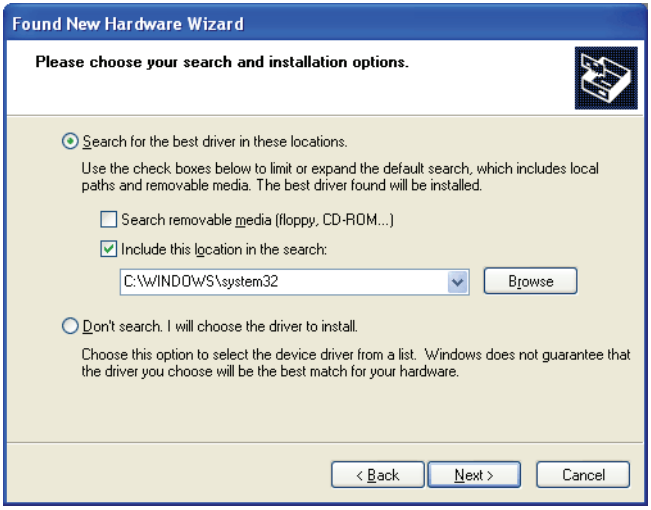
4 Select next and then select “Install from a list or specific location (Advanced)”. Refer to Figure 12.

Figure 12 Install from specific location


Found New Hardware Wizard
This wizard helps you install software for:
SmartTAP LD409 device
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

5 Choose the following location to install the driver from; C:\WINDWOS\system32. The driver should already be on your system. Refer to Figure 13.

Figure 13 Enter driver location


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
C:\WINDOWS\system32
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

6 Follow the installation wizard until the driver for the audio PCI card has been detected and installed.

7 You may be asked to re-boot your PC.

8 After installation, check your PC system hardware configuration to verify the driver and audio PCI card have been installed and detected.

Setting up the software and license key (Mobile Van)

You need to install the software and set up the license key for both the client PC in the mobile van. Each PC requires a separate copy of the Mobile VQT Software.

NOTE The 10/100 licenses is not used by the mobile van configuration. However, the license still needs to be enabled as it is an integral part of the VQT application, which is the same application used on the server (CO) side of the network.

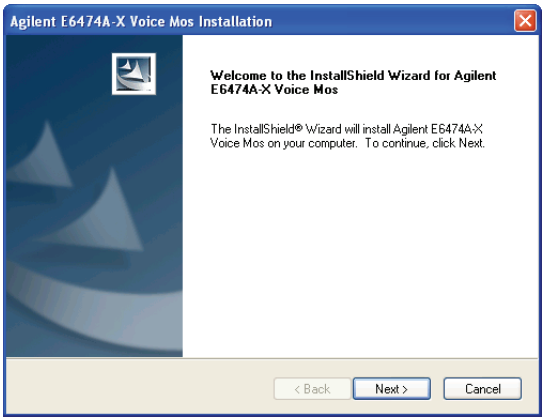
NOTE To use the USB Audio Module and test mobiles you need to install the E6474A Wireless Network Measurement Software. Refer to the E6474A User's Guide for more information on installation and configuration.

Installing the VQT applications at the Mobile Van

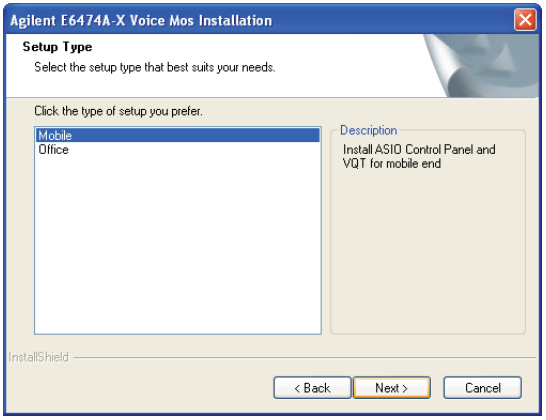
The Agilent Mobile Voice MOS Test Software solution consists of the VQT (including PESQ algorithm).

To install the applications:

Do This		Notes
1	**Insert** the CD	This CD contains several applications.
2	Your system may have autostart or go to the **Start** button, click **Run** and type D:\ setup (where D is your CD drive).	The following installation dialog appears (see below).


Agilent E6474A-X Voice Mos Installation
Welcome to the InstallShield Wizard for Agilent E6474A-X Voice Mos
The InstallShield® Wizard will install Agilent E6474A-X Voice Mos on your computer. To continue, click Next.
< Back
Next >
Cancel

3	Select the **Mobile** installation option.	The following installation dialog appears (see below).



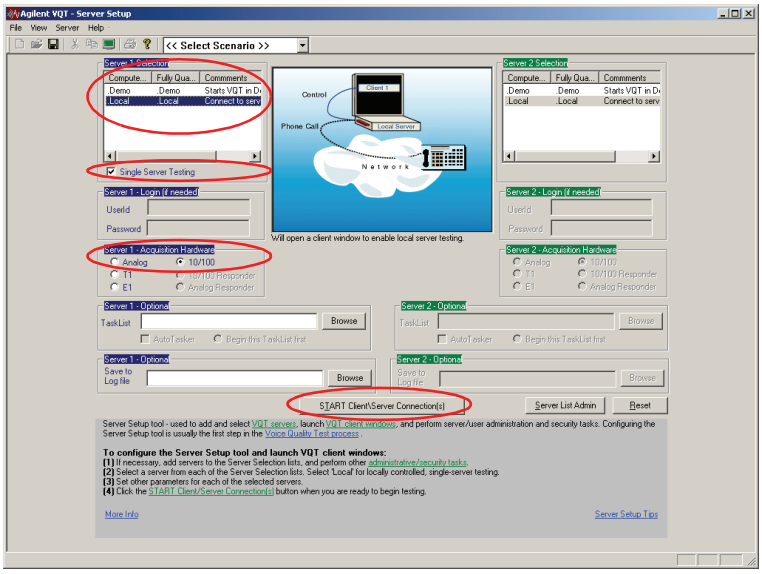
4	Follow the installation instructions. Use the default directories	

Setting up the VQT license keys

Follow these steps:

1 Start the VQT application.

Figure 14 Server Setup dialog box


Agilent VQT - Server Setup
File View Server Help
<< Select Scenario >>
Server 1 Selection
Compute... Fully Qua... Comments
Demo Demo Starts VQT in D
Local Local Connect to serv
Single Server Testing
Server 1 - Login (if needed)
UserId
Password
Server 1 - Acquisition Hardware
Analog
10/100
T1
10/100 Responder
E1
Analog Responder
Server 1 - Options
TaskList
Browse
AutoTasker
Begin this TaskList first
Save to Log file
Control
Client 1
Phone Call
Local Server
Network
Will open a client window to enable local server testing.
Server 2 Selection
Server 2 - Login (if needed)
Server 2 - Acquisition Hardware
Server 2 - Options
START Client\Server Connection(s)
Server List Admin
Reset
Server Setup tool - used to add and select VQT servers, launch VQT client windows, and perform server/user administration and security tasks. Configuring the Server Setup tool is usually the first step in the Voice Quality Test process.
To configure the Server Setup tool and launch VQT client windows:
(1) If necessary, add servers to the Server Selection lists, and perform other administrative/security tasks.
(2) Select a server from each of the Server Selection lists. Select 'Local' for locally controlled, single-server testing.
(3) Set other parameters for each of the selected servers.
(4) Click the START Client/Server Connection(s) button when you are ready to begin testing.
More Info
Server Setup Tips

2 In the **Server 1 Selection** list, select **Local**.

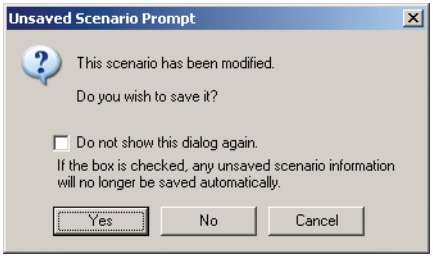
3 Select the **Single Server Testing** check box.

4 Under **Server 1 - Acquisition Hardware**, select **10/100**.

5 Click **START Client/Server Connections**.

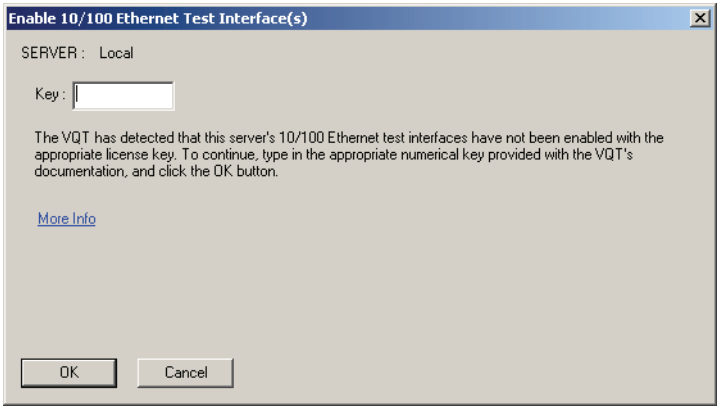
You are prompted to save your configuration. Select **Yes** and enter a configuration name.

Figure 15 Unsaved Scenario Dialog


Unsaved Scenario Prompt
This scenario has been modified.
Do you wish to save it?
Do not show this dialog again.
If the box is checked, any unsaved scenario information will no longer be saved automatically.
Yes
No
Cancel

After you have saved the configuration the **Enable 10/100 Ethernet Test Interface(s)** dialog box appears.

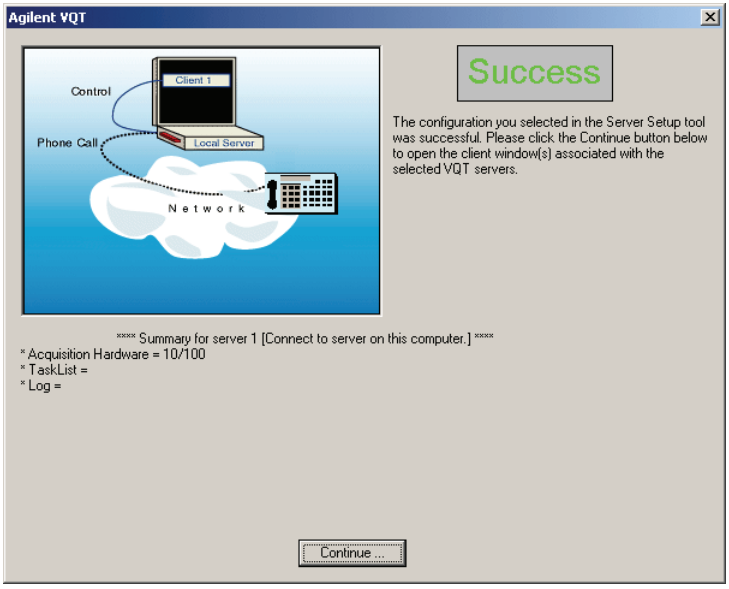
Figure 16 Enable 10/100 Ethernet Test Interface(s) dialog box


Enable 10/100 Ethernet Test Interface(s)
SERVER : Local
Key :
The VQT has detected that this server's 10/100 Ethernet test interfaces have not been enabled with the appropriate license key. To continue, type in the appropriate numerical key provided with the VQT's documentation, and click the OK button.
More Info
OK
Cancel

6 Enter the 10/100 license key and click **OK**.

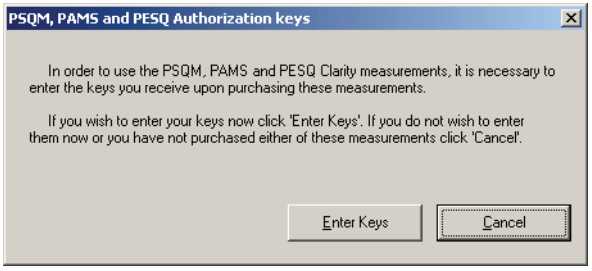
7 When the **Success** dialog appears, select **Continue**.

Figure 17 10/100 License Success Dialog


Agilent VQT
Control
Client 1
Phone Call
Local Server
Network
Success
The configuration you selected in the Server Setup tool was successful. Please click the Continue button below to open the client window(s) associated with the selected VQT servers.
***** Summary for server 1 [Connect to server on this computer.] *****
* Acquisition Hardware = 10/100
* TaskList =
* Log =
Continue ...

8 In the PSQM, PAMS and PESQ Authorization keys dialog, select **Enter Keys**.

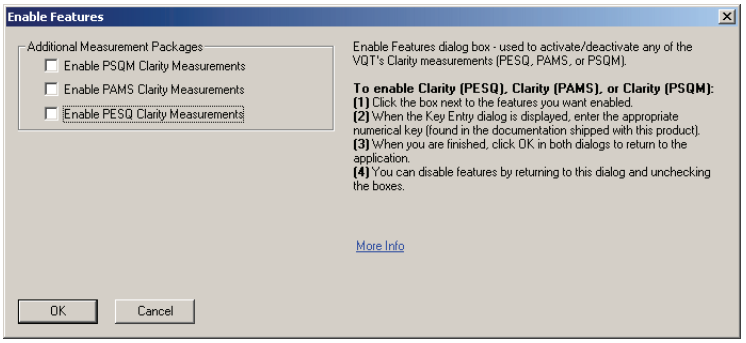
Figure 18 PSQM, PAMS and PESQ Authorization keys dialog


PSQM, PAMS and PESQ Authorization keys
In order to use the PSQM, PAMS and PESQ Clarity measurements, it is necessary to enter the keys you receive upon purchasing these measurements.
If you wish to enter your keys now click 'Enter Keys'. If you do not wish to enter them now or you have not purchased either of these measurements click 'Cancel'.
Enter Keys
Cancel

9 In the Enable Features dialog, select the **Enable PESQ Clarity Measurement** option.

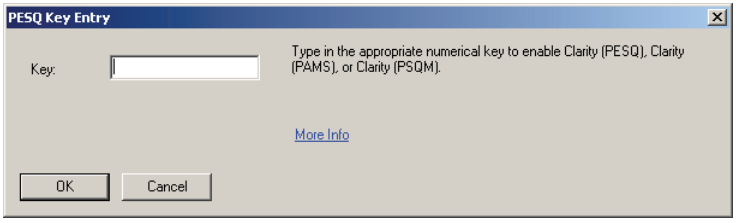
The **PESQ Key Entry** dialog box appears.

Figure 19 Enabling ITU standard PESQ measurement


Enable Features
Additional Measurement Packages
Enable PSQM Clarity Measurements
Enable PAMS Clarity Measurements
Enable PESQ Clarity Measurements
Enable Features dialog box - used to activate/deactivate any of the VQT's Clarity measurements (PESQ, PAMS, or PSQM).
To enable Clarity (PESQ), Clarity (PAMS), or Clarity (PSQM):
(1) Click the box next to the features you want enabled.
(2) When the Key Entry dialog is displayed, enter the appropriate numerical key (found in the documentation shipped with this product).
(3) When you are finished, click OK in both dialogs to return to the application.
(4) You can disable features by returning to this dialog and unchecking the boxes.
More Info
OK
Cancel

10 Enter the PESQ key and then click **OK**.

Figure 20 PESQ Key Entry dialog box



11 Click **OK** to close the **Enable Features** dialog box.

12 Exit the VQT application.

Setting up the USB Audio Module

NOTE Before setting up your USB Audio Module, follow the manufacturers instructions for installing device drivers and configuring the hardware.

The USB Audio Module needs to be configured to provide the calibrated audio support for mobile voice quality testing. The following settings should be made before any voice MOS tests are run.

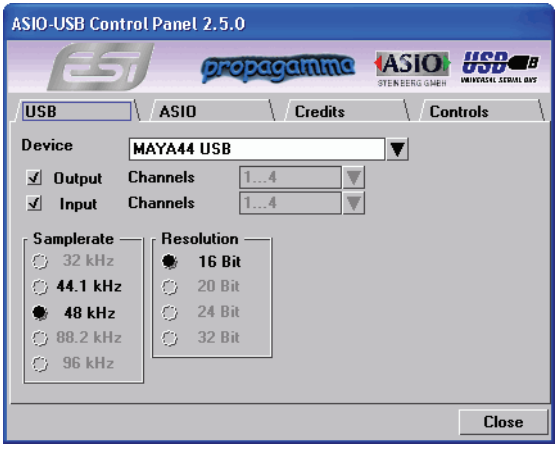
Follow these steps:

1 Open the ASIO-USB Control Panel. Select **Start > All Programs > Agilent Wireless Solutions > E6474A > Utilities > ASIO USB Control Panel**.

2 Select the USB Tab and set as follows (refer to Figure 21 on page 27):

- Device: MAYA44 USB
- Output enabled
- Input enabled
- Sample Rate: 48 KHz
- Resolution: 16 Bit

Figure 21 ASIO USB Control - USB Tab options

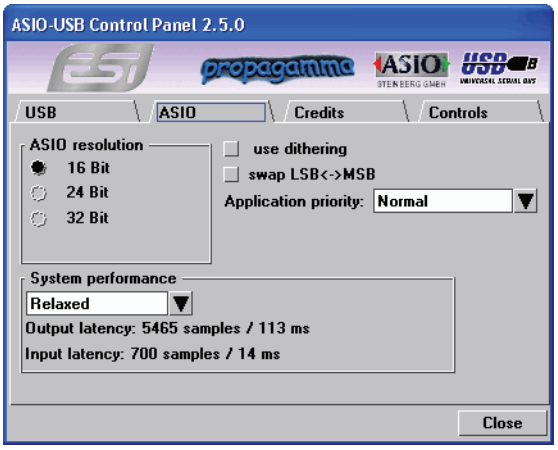


3 Select the ASIO Tab and set as follows (refer to Figure 22 on page 28):

- ASIO resolution: 16 Bit

- System Performance: Relaxed

Figure 22 ASIO USB Control - ASIO tab options

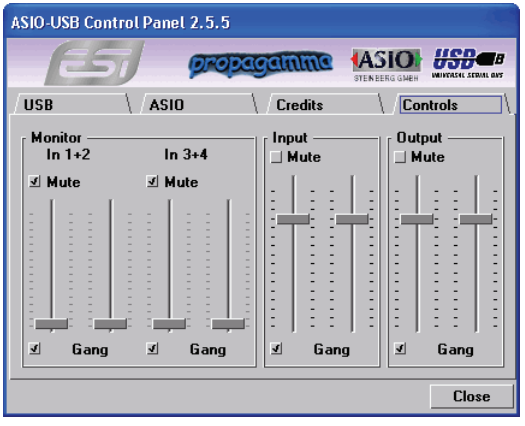


4 Select the Control Tab and set as follows (refer to Figure 23 on page 28):

- Mute all channel Monitor.
- Input and Output: Set as required.

  The left slider controls channels 1 and 3. The right slider controls channels 2 and 4.

Figure 23 ASIO USB Control - Controls tab options



2
Measuring Voice Quality

Part 1: Voice MOS Test (VMT) Office Utility 30
Part 2: Preparing Central Office for measurements 31
Part 3: Using Mobile Van and E6474A Sequencer for measurements 35
Part 4: Measurement results 38

The measurement of mobile network voice quality makes use of two separate sets of equipment.

- Mobile van equipment.
- Central Office (CO) equipment.

Based on individual requirements, you need to configure parameters on both systems using the Voice MOS Test (VMT) Office Utility, Voice MOS Test and USB Audio Module control applications prior to running measurements.

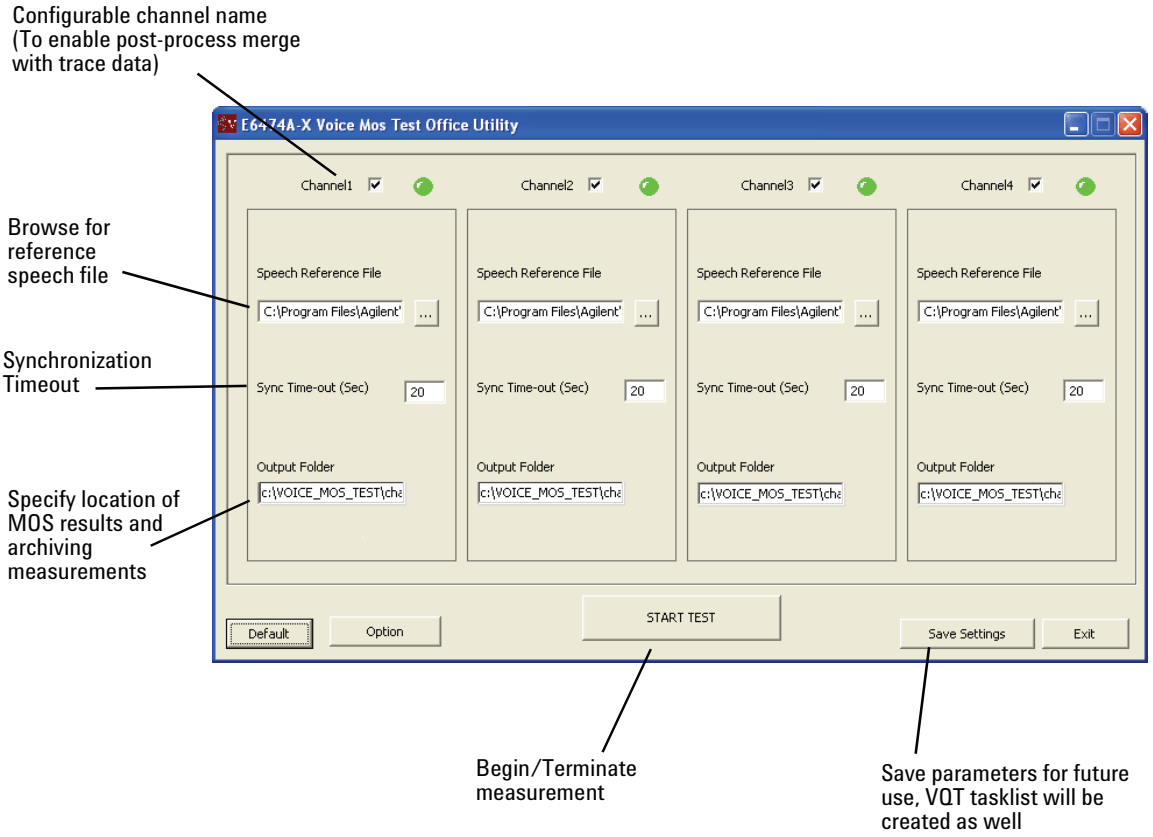
Once the system has been set up, the central office sub-system will be in the slave/stand-by mode, and the van sub-system will be the master controlling the execution of measurements.

Prior to starting measurements, it is recommended that you refer to the section, “Part 4: Measurement results” in this chapter.

Part 1: Voice MOS Test (VMT) Office Utility

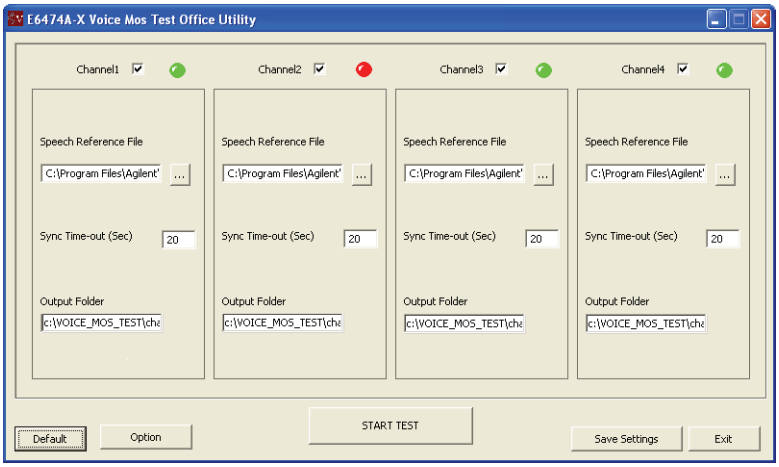
The VMT Office Utility allows you to configure parameters or start testing at central office (server) part of the system. To start the utility, select
Start > All Programs > Agilent VQT > Voice MOS Office Test Utility.

Figure 24 Agilent Mobile Voice Mos Test Software Office Utility



Part 2: Preparing Central Office for measurements

Figure 25 Agilent VMT sample uplink parameters



1 Start Agilent VMT.

2 Activate the desired test channel by selecting its corresponding check box.

NOTE

When a the Channel LED is green then the telephony line is connected. When the Channel LED is red then the telephony line is unplugged or faulty. When the Channel LED flashes green then telephony line is connected and a call is in progress.

3 Select the reference speech file. It must be any speech file located in the folder, C:\Program Files\Agilent\Telegra VQT\Data\Wav\PESQ.

PESQ WAV file requirements can be found in the VQT software online help.

4 Enter the number of iterations of the test to be performed.

5 Enter a time-out period sufficient to cover the number of defined iterations. Generally this is approximately 20 seconds per iteration.

NOTE

Each iteration will consist of a pair of downlink and uplink data point. The estimated test time for each iteration is approximately one minute.

It is highly recommended that you use the default 20 secs time-out between each measurement. This will allow the system to recover from dropped call.

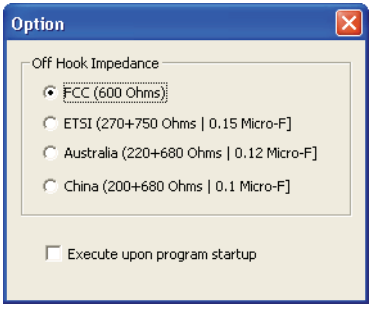
6 Define a different work directory for each channel. Each work directory will store the recorded speech and MOS result file for the individual channel.

NOTE

Do not use a directory name with space.

7 If necessary, change the line impedance settings. Select the Options button to open the dialog box. Once set "Save Settings" will allow you to use these settings for other tests. Check with your local phone-line provider to verify the line impedance used.

Figure 26 Setting the line impedance


Option
Off Hook Impedance
FCC (600 Ohms)
ETSI (270+750 Ohms | 0.15 Micro-F]
Australia (220+680 Ohms | 0.12 Micro-F]
China (200+680 Ohms | 0.1 Micro-F]
Execute upon program startup

8 Click **START TEST**.

9 At any point of time, or upon completion of measurement, clicking **STOP TEST** will terminate measurement and generate MOS results.

How to enable auto-run after a reboot

The Voice MOS Test Office Utility may be configured as a startup program when your Windows operating systems starts and logs in. If measurements are to be made automatically after a reboot of your PC, the operating system needs to have the auto-login enabled.

The following procedure outlines this process:

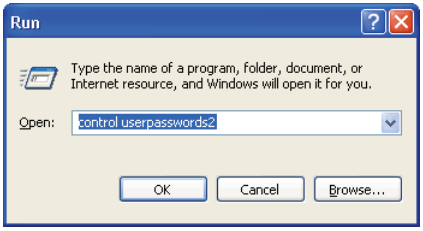
1 Enable the “Execute upon program startup” option in the Options dialog box. Select Options button to open this dialog box.

2 Close the dialog box and save the settings

3 Configure your PC to perform an auto-login:

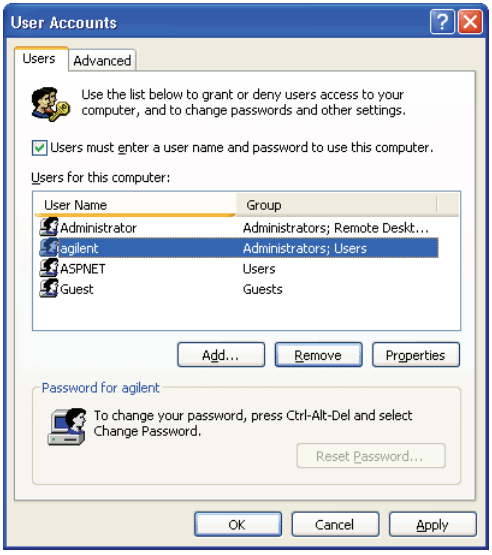
a Select Start > Run and type “CONTROL USERPASSWORDS2”. This opens the User Accounts dialog box.

Figure 27 Open User Accounts dialog box



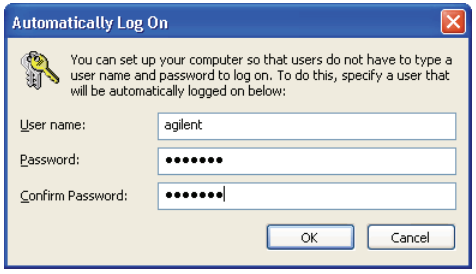
b Select the “agilent” account and uncheck “User must enter a user name and password to use this computer”.

Figure 28 Set password requirement



c When prompted, type the default password “agilent” that is be used for auto-logon.

Figure 29 Confirm password


Automatically Log On
You can set up your computer so that users do not have to type a user name and password to log on. To do this, specify a user that will be automatically logged on below:
User name:
agilent
Password:
Confirm Password:
OK
Cancel

NOTE To revert to the normal Windows logon procedure, enable the “user must enter a user name and password to use this computer”.

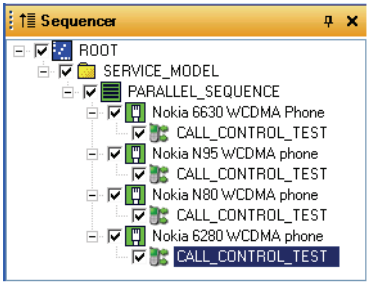
Part 3: Using Mobile Van and E6474A Sequencer for measurements

1 Run the Agilent E6474A application. (Refer to the E6474A User's Guide and online help for more information).

2 After configuring your hardware add the phone device to your sequence in the sequencer system panel.

3 Add a parallel sequence node (refer to Figure 30).

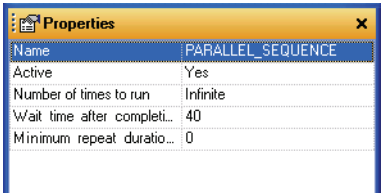
Figure 30 Parallel Sequence example



4 Check that the sequence nodes and tests are configured with these properties:

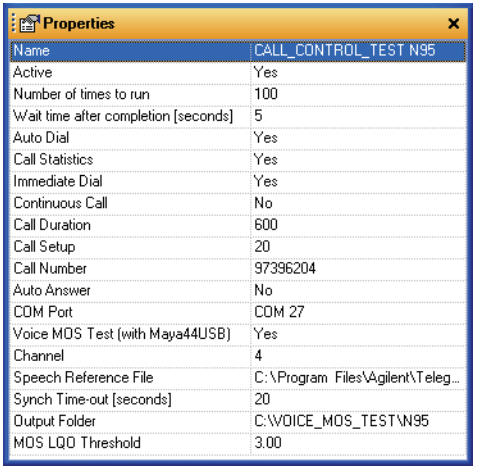
- Parallel node properties (refer to Figure 31)
  - **a** Number of times to run = Infinite
  - **b** Wait time after completion = 40
    This is the time between each measurement session/call to be initiated by the application. 40 seconds is a safe duration to ensure that the office unit recovers from an abnormal call, and is ready to make measurements again.
  - **c** Minimum repeat duration = 0

Figure 31 Parallel Node properties



- Call Control Test - Call Initiator (refer to Figure 32)
  - **a** Auto Dial = YES
  - **b** Immediate Dial = YES
  - **c** Continuous Call = NO
  - **d** Call Duration = 200 or above
    It is recommended to establish a call with the minimum 200 seconds when running the Voice MOS Test. This allows several MOS to be collected and obtain meaningful measurement results for each call session.
  - **e** Call Setup = 20
  - **f** Enter an appropriate call number
  - **g** Select the correct call COM port
  - **h** Set Auto Answer = No
  - **i** Voice MOS Test = Yes
  - **j** Channel - select the channel for the USB audio device
  - **k** Set the other properties for the Voice MOS Test according to your network and test requirements.

Figure 32 Call Control Test Properties - Initiator



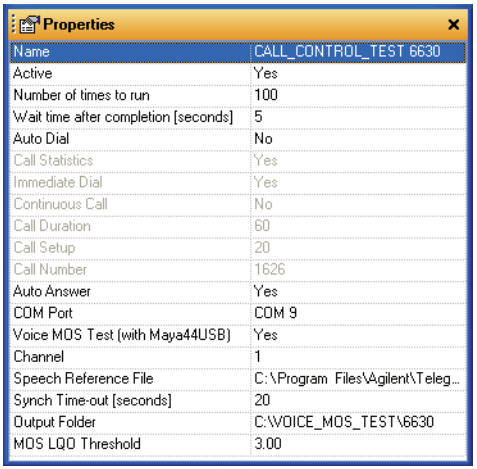
- Call Control Test - Call Receiver (refer to Figure 33)
  - **a** Auto Dial = No

b Auto Answer = Yes

c Channel - select the channel for the USB audio device

d Set the other properties for the Voice MOS Test according to your network and test requirements.

Figure 33 Call Control Properties - Receiver



5 In the Sequencer window, activate the desired test channel by selecting its corresponding check box, in accordance with the USB Audio Module configuration.

One major advantage in using E6474A Sequencer is the ability to automatically re-dial individual channel upon dropped call.

6 On the toolbar, start logging in the E6474A software.

The Agilent server VQT program starts automatically.

At the end of measurements, the status panel will display task status. Upon completion of measurement iterations for all activated channels, MOS results will be automatically generated.

Part 4: Measurement results

Downlink MOS results can be found on the mobile van PC, while uplink MOS results on the CO control PC.

At the end of measurement, MOS results for each channel will be displayed in the E6474A application. Recorded speech samples and VQT log files are archived in the work directory that was defined in the test properties in the E6474A application.

Downlink MOS results are stored in the recorded data file in the E6474A application.

Uplink MOS results can be found in the “mos_score.txt” file which is located in the output folder for each channel.

As the results are time-stamped for both downlink and uplink MOS, it is recommended that you manually time-sync the clock for both mobile and CO control PC.

Detailed test results can be displayed during the test using a grid, chart and map view. Refer to Figure 34 on page 38 and Figure 35 on page 39 for examples of data used and data collected.

Figure 34 Data items that can be added to views

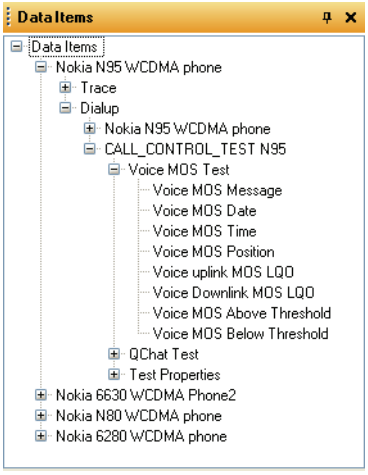
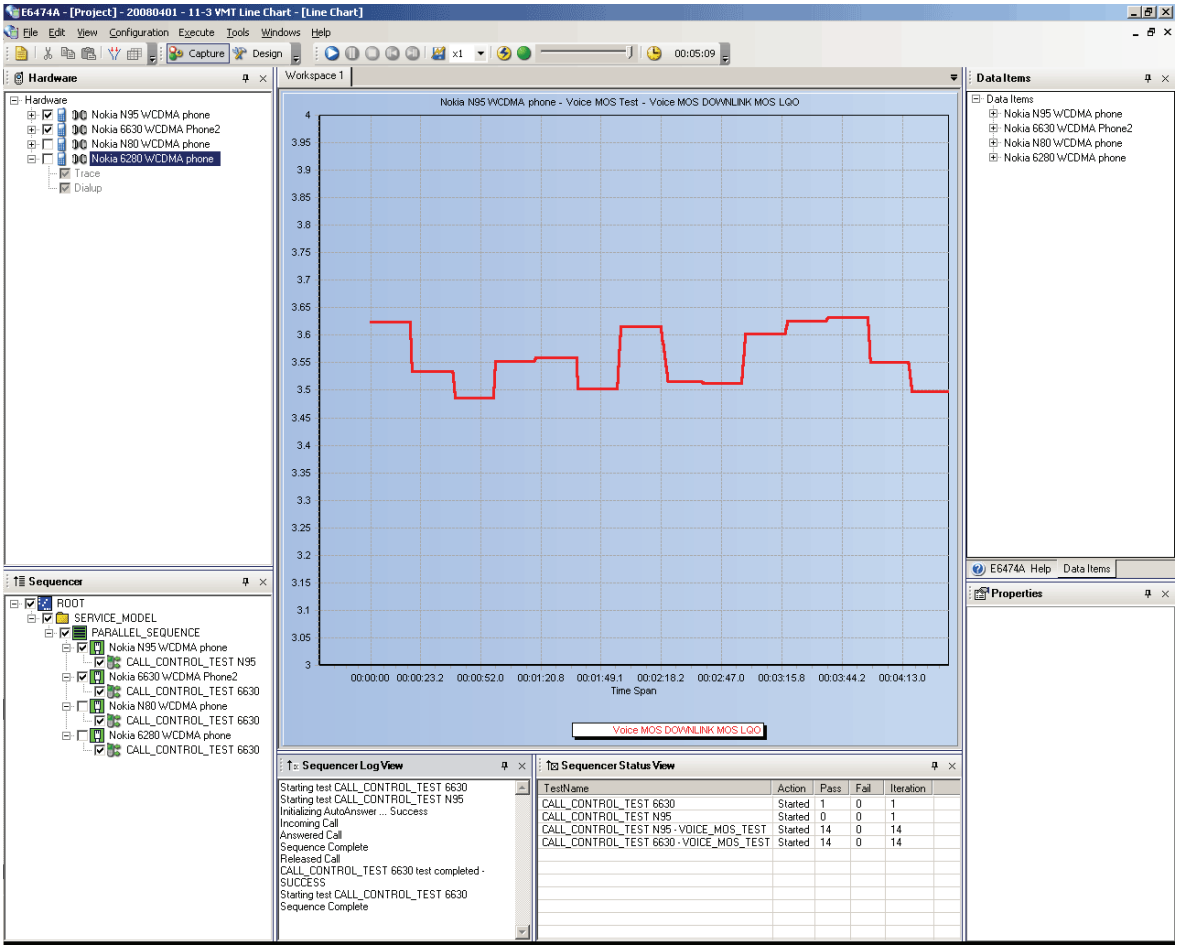


Figure 35 Chart View example



3 Troubleshooting

This chapter consists of frequently asked questions and contact information.

Frequently Asked Questions

Why is the VQT program not launching?

Ensure the default directories are used during the installation process.

Can customized speech file be used to perform measurement?

No, it cannot. The supplied collection of speech is recommended for the ITU standard PESQ algorithm. The collection of male and female speech is a good representation of various phonemes in different languages.

What to do when there is an error message related to the reference speech?

The collection of speech is only available after entering the PESQ license. Refer to “Setting up the VQT license keys” on page 14 for license entering process. The speech directories may take up to five minutes before they appear in the default location “C:\Program Files\Agilent\Telegra VQT\Data\Wav\PESQ”, under the folders American/British/Canton/French/German/Japanese/Korean/Mandarin/Spanish.

Why is the equipment in the central office not picking up calls?

The call may be from a digital phone. Some offices use digital phones. The equipment only supports analog phone lines. However the equipment can be connected to a digital ISDN phone line as long an ISDN-to-analog converter is used.

Why is the file, mos_score.txt, not available after data collection?

You may have used space characters when naming some of the folders in the work directory. Remove all space characters from the path of the work directory on the central office.

You are not able to perform Voice MOS test.

Under Voice MOS Message area you get following error message: “Reference File Error: Not a Wave File, or Longer than 20 seconds”

This error will happen when you installed both Office and Mobile Voice Quality applications, but then did not enter the Client License, VQT 10/100 License and PESQ License. Refer to page 12 and page 21 for more information on setting up licenses.

Missing PESQ licenses

After following the procedure for setting up three licenses for Voice MOS test you did not get the screen to enter PESQ license as described in “In the PSQM, PAMS and PESQ Authorization keys dialog, select Enter Keys (Figure 8).” on page 16.

Open VQT application and do following:

1. Server 1 Selection: Highlight Local
2. Check Single Server Testing
3. Server 1 Acquisition Hardware: Check 10/100
4. Press: Start Client\Server Connection
5. Click: Continue when Success screen comes up

6 Click: File and choose Enable Features

7 Check: Enable PESQ and enter ten digit key code

8 Exit

Could not locate E6474A Voice MOS Test Office Utility.

You may have installed the Mobile application on your Central Office desktop. Please go to Add/Remove Programs and delete following programs:

- Agilent E6474A-X Voice Mos Test
- Agilent VQT 4.500
- Agilent VQT Client for Remote Control
- Agilent VQT Server

After removal of above applications, Reinstall from the CD and make sure that you select Office during the installation process (refer to step 3 on page 13.).

Continuous Synchronization Time-out error when I start Voice MOS testing

The Maya 44 USB device needs to be properly configured before starting Voice MOS test.

After installing Maya 44 USB audio device, you must initialize ASIO Control Panel and properly configure the USB Tab, ASIO Tab, and Controls Tab. To open ASIO Control Panel go to: Start > Programs > Agilent Wireless Solutions > Utilities > ASIO Control Panel.

Configure the ASIO control panel as follows:

USB Tab:	• Output and Input must be checked • Sample rate set to 48KHz • Resolution set to 16 bit
ASIO Tab:	• ASIO Resolution: 16 bit • System Performance: Relaxed • Use Dithering: Unchecked • Swap LSB<->MSB: Unchecked • Application Priority: Normal
Controls Tab:	• Monitor Area: Mute both • Input/Output Area: Check Gang for both. Make sure that Mute is unchecked. Place both Equalizer bars to 1/3 position from the top. This would an be appropriate level for all technologies. These settings ensure that an adequate audio signal gets through without preventing clipping of the audio samples.

Received low MOS (1.0 range) scores on my mobile unit even though the MOS_Value text file on the office unit was completely empty. Also, the diagnostic uplink audio files were not recorded on the office side.

The E6474A Voice MOS Test Office Utility was not opened and loaded on the office desktop or the STOP button has been pressed on the utility.

Before starting the voice quality test, please make sure that E6474A Voice MOS Test Office Utility is loaded and in a ready state (The button in the lower middle must say “Stop Test”). Also, it is good practice to empty CH1 through to CH4 directories prior the voice MOS test. This way only the current test data is stored in the directory.

Interference between the Maya device and phones may introduce undesirable noise on internal audio processing. It is recommended to separate them approximately 2 inches (50 mm).

Repeatedly receiving low 1.0 MOS scores while testing Voice MOS

The most likely reason for repeated low MOS score is a miss-match of speech samples. Verify that the speech sample on the E6474A Voice MOS Test Office Utility matches the speech sample in the Sequencer Call Control Test properties. The miss-matched samples will generate continuous low MOS score in 1.0 range. Alternatively, verify that the correct speech sample is played, by dialing and listening to the speech playback.

Continuous Synch Time-out errors with Voice MOS test

The RCA connection to the Maya USB device might be incorrect. This could be a wrong channel (you must use the same channel as selected in E6474A Sequencer properties), or Ear/Mouth (Analog IN/Analog OUT) connections are reversed.

Also, if audio is heard through the phone (often the case with some Nokia GSM/UMTS phones) it may be necessary to disconnect and reconnect data cable so that the phone can properly detect audio cables. Ensure that the phone is neither muted or the volume is too low (at least half of max volume on most phones).

Contact Information

For technical support, contact your local country-specific Agilent office and they will quickly forward your enquiry to the person who can best help you solve your problem.

For up-to-date, country-specific contact information, go to **http://www.agilent.com/find/contactus**.

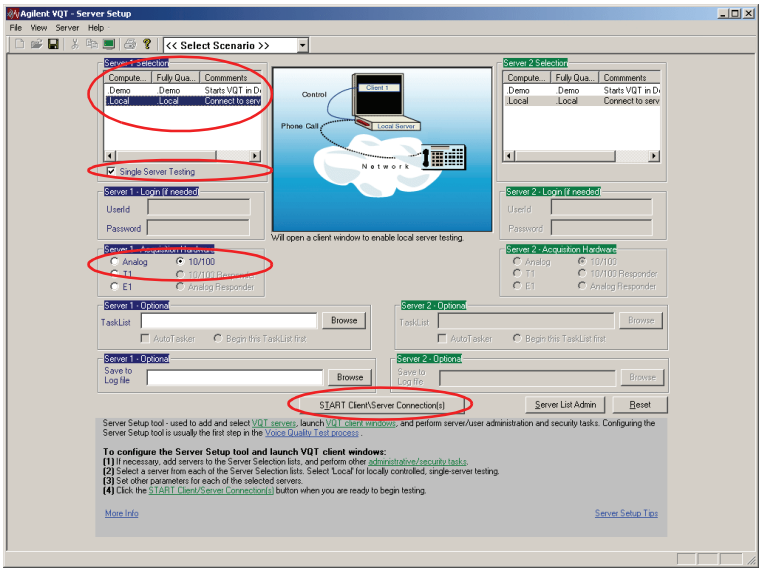
A
Appendix A- Calibration of USB Audio Module

Measurement may normally be performed at the recommended settings for the ASIO USB control application, refer to “Setting up the USB Audio Module” on page 26. However, attenuation or boosting of voice amplitude may occur along the communication network (which includes the mobile handset), such that undesirable low SNR (signal-to-noise-ratio) or clipping occurs. Hence, it may be necessary to adjust the gain setting for downlink (ear gain) or uplink (month gain). Use the ASIO USB Control application to set the levels.

1. To verify if calibration is necessary, start the measurement and let it run for about 3 minutes before terminating measurement (may also setup the system to run 2 iterations).
2. Start the VQT application.

The **Server Setup** dialog box appears.

Figure 36 Check if USB Audio Module calibration is necessary


Agilent VQT - Server Setup
File View Server Help
<< Select Scenario >>
Server 1 Selection
Compute... Fully Qua... Comments
Demo Demo Starts VQT in D
Local Local Connect to serv
Single Server Testing
Server 1 - Login if needed
UserId
Password
Server 1 - Acquisition Hardware
Analog
10/100
T1
10/100 Responder
E1
Analog Responder
Server 1 - Options
TaskList
Browse
AutoTasker
Begin this TaskList first
Save to Log file
Control
Client 1
Phone Call
Local Server
Network
Will open a client window to enable local server testing.
Server 2 Selection
Server 2 - Login if needed
Server 2 - Acquisition Hardware
Server 2 - Options
START Client\Server Connection(s)
Server List Admin
Reset
Server Setup tool - used to add and select VQT servers, launch VQT client windows, and perform server/user administration and security tasks. Configuring the Server Setup tool is usually the first step in the Voice Quality Test process.
To configure the Server Setup tool and launch VQT client windows:
(1) If necessary, add servers to the Server Selection lists, and perform other administrative/security tasks.
(2) Select a server from each of the Server Selection lists. Select 'Local' for locally controlled, single-server testing.
(3) Set other parameters for each of the selected servers.
(4) Click the START Client/Server Connection(s) button when you are ready to begin testing.
More Info
Server Setup Tips

3 In the **Server 1 Selection** list, select **Local**.

4 Select the **Single Server Testing** check box.

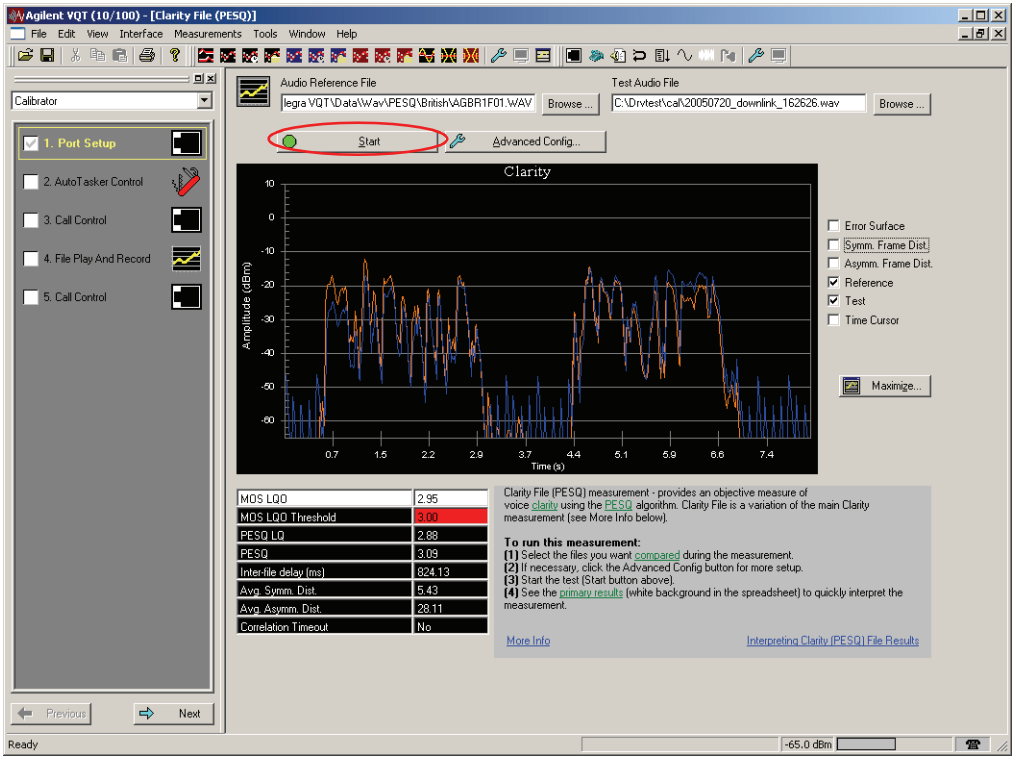
5 Under **Server 1 - Acquisition Hardware**, select **10/100**.

6 Click **START Client/Server Connections**.

7 Click **Start** in the right panel of the window. (See Figure 37.)

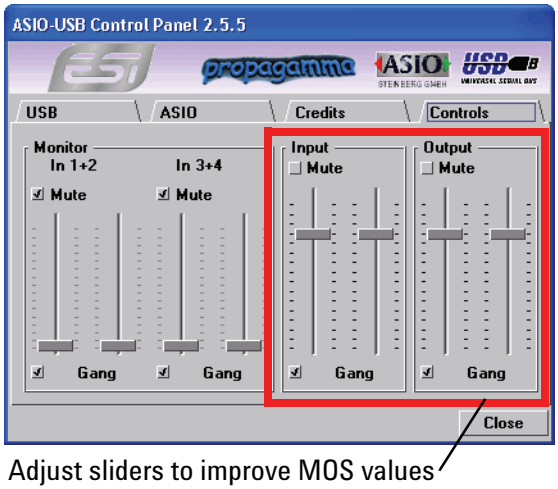
For good results, test (measured) waveform's peak is normally within 4 dB of the reference waveform's peak.

Figure 37 Peak of reference and test waveforms are within 4 dB of each other



8 If the test waveform is outside the 4 dB range adjust the Input and Output Control sliders on the ASIO USB Control Panel. See Figure 38 on page 50.

Figure 38 ASIO USB Control Panel adjustments



Both the ear and microphone need to be calibrated. The ear calibration affects the downlink quality (mobile side of the system). The microphone calibration affects the uplink quality (central office side of the system).

It is recommended that the volume levels of the phone should be set around the middle of their range, then adjust the levels using the ASIO USB Control Panel.

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